REMARKS

Claims 1-3, 7-9, 11, 16-20, 25, 58 and 62 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka (U.S. Patent No. 5,718,620). Claims 1, 7-10, 15-17, 27-29, 32-34, 37, 38, 49, 50, 53-55, 57, 58, 62, 63, and 67 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kurisawa (U.S. Patent No. 6,183,352 B1).

Claim 1 is amended to include the limitations of claim 6 which was objected to for depending from a rejected base claim (claim 1). Accordingly, claim 1 as amended overcomes the obviousness rejection, and therefore, is allowable. Applicant respectfully requests allowance of claim 1 in the next Office Action.

Claims 2-5 and 7-17 depend from independent claim 1, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown nor taught by the cited references.

An obviousness rejection requires consideration of all the elements of the claimed invention. Further, all such elements must be shown to be suggested by the prior art when making a rejection based upon obviousness under 35 U.S.C. §103(a). In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1987).

Independent Claim 18 recites a connection coupled with a process chamber and configured to transport a process fluid, and a sampling system coupled with the connection and configured to receive a sample of the process fluid. Not one of the references, singularly or in any combination, teach a sampling system coupled with the connection and configured to receive **a sampl** of the process fluid and the teachings of the references do not support an obviousness rejection of the claim.

The Examiner relies on Tanaka suggesting an abrasive compound tank 13 is a sampling system (page 2 of paper no. 9). An exemplary definition of sample is provided as a small segment or quantity taken as evidence of the quality or character of the entire group or lot (Webster's Third New International Dictionary, Copyright 1976, vol. III, page 2008). Tanaka teaches the abrasive compound tank 13 receives the abrasive compound 9 that flows radially outwardly on the reference table 2 and falls off the outer circumferential edge thereof (col. 6, lines 1-13). That is, no **sample**, or no small segment or quantity, is taken as evidence of the quality or character of the entire group. Such is clear when the full disclosure of Tanaka is considered which is dedicated to teaching a method of dissipating heat from a polishing machine (col. 1, lines 11-13). The abrasive compound 9 is used to both polish and cool the semiconductor wafer 7 (col. 5, lines 65-67). The abrasive compound tank 13 is used to provide the medium for keeping the abrasive compound 9 at a predetermined temperature (col. 6, lines 13-27). Consequently, using the abrasive compound tank 13 as a sample would defeat the purpose of the disclosure of Tanaka because a sample of abrasive compound 9 supplied to the abrasive compound tank 13 of Tanaka would not sufficiently dissipate heat from the polishing machine. Further, tank 13 stores an entirety of the compound 9 not being transported to or from the wafer and can in no fair interpretation be considered to disclose or suggest a sampling system configured to receive a sample. No reasonable interpretation of the abrasive compound tank 13 could suggest a sampling system configured to receive **a sample** of the process fluid as recited by claim 18. Accordingly, the reference cited by the Examiner fails to teach all the recited features of claim 18, as required for a proper §103 rejection. Accordingly, the claim as written is allowable.

Furthermore, the rejection is based upon impermissible hindsight reconstruction using Applicant's disclosure as the roadmap for the reconstruction. *See, e.g., Interconnect Planning Corp. v. Feil*, 227 USPQ 543, 551 (Fed. Cir. 1985); *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990) (explaining that hindsight reconstruction is an improper basis for rejection of a claim). Such is improper, and the rejection should be withdrawn. Applicant respectfully requests allowance of claim 18 in the next Office Action.

Claims 19-26 depend from independent claim 18, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown nor taught by the cited references.

Claim 27 recites a mixer configured to mix a plurality of components of a process fluid and a sensor configured to output a signal indicative of at least one of the components. Claim 27 further recites a control system coupled with the sensor and configured to control mixing of the components responsive to the signal. Not one of the references cited by the Examiner teach or disclose, singularly or in any combination, a sensor configured *to output a signal indicative of at least one of the components of a process fluid.* The Examiner relies on Kurisawa to teach the recited features of claim 27. However, Kurisawa provides a number of teachings to monitoring a concentration and/or flow of a slurry used for processing, and then based on that monitoring, adding components to the slurry (see: col. 1, lines 40-50; col. 1, lines 51-60; col. 2, lines 10-19; col. 2, lines 23-25; col. 2, lines 52-56; col. 2-3, lines 64-67 and 1-4, respectively; col. 3, lines 10-15; col. 7, lines 35-40; col. 8 lines 47-51; col 9, lines 10-18; col. 10, lines 32-34). Accordingly, it is inconceivable how the reference could teach a sensor configured to output a signal indicative **of at least on of th**

compon nts when the disclosure only teaches to monitor the concentration of the slurry. For at least this reason, claim 27 is allowable. Applicant requests allowance of claim 27 in the next Office Action.

With reference to Fig. 1, the entire slurry used for processing wafers within tanks 15A, 15B are monitored using analyzer 20B. Fig. 1 provides no structure to monitor individual components of the slurry. Further, analyzer 39 of Fig. 3 only monitors the slurry and not individual components thereof. No sensor configured to output a signal indicative of a component of a process fluid is disclosed or suggested in Kurisawa. Claim 27 is allowable.

Claims 28-33 depend from independent claim 27, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown not taught by the cited references.

Claim 34 is amended to recite a recirculation system configured to recirculate a process fluid to a homogeneous level. Not one of the references, singularly or in any combination, teach a recirculation system configured to recirculate a process fluid to a homogeneous level. Applicants have electronically searched the Kurisawa patent and have failed to uncover any teachings or suggestion of homogeneous levels of a process fluid. Kurisawa provides a number of teachings for monitoring a concentration and/or flow of a slurry, and then based on that monitoring, adding components to the slurry. Such teaching cannot reasonably be considered to teach a system configured to recirculate a process fluid to a homogeneous level as specifically claimed in claim 34. Accordingly, claim 34 is allowable. Applicant respectively requests allowance of claim 34 in the next Office Action.

Claims 35-38 depend from independent claim 34, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown nor taught by the cited references.

Claim 49 recites a sensor coupled with a connection and configured to output a signal indicative of accumulation of particulate matter within the connection. Not one of the references, singularly or in any combination, teach a signal configured to output a signal indicative of an **accumulation** of particulate matter. Kurisawa provides a number of teachings to monitoring a concentration and/or flow of a slurry, and then based on that monitoring, adding components to the slurry. Such teachings cannot reasonably be suggested to disclose or suggest a sensor configured to monitor accumulation of particulate matter in a connection. In fact, the only monitoring Kurisawa is performed within storage tanks and cannot be fairly interpreted as monitoring particulate matter in a connection. Accordingly, claim 49 is allowable. Applicant respectively requests allowance of claim 49 in the next Office Action.

Claims 50-57 depend from independent claim 49, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown not taught by the cited references.

Claim 58 recites a drain coupled to the connection, and the control system is configured to control the drain to remove at least a portion of the semiconductor workpiece process fluid from the system responsive to the signal from the sensor. Not one of the references, singularly or in any combination, teach a drain, must less a drain coupled to the connection and the control system is configured to control the drain to remove at least a portion of the

semiconductor workpiece process fluid from the system responsive to the signal from the sensor. Since an obviousness rejection requires all the elements of the claimed invention to be taught or suggested by the cited references, claim 58 overcomes the obviousness rejection inasmuch as positively recited limitations of claim 58 are not shown or suggested in the art. The Applicant requests allowance of claim 58 in the next Office Action.

Claims 59-62 depend from independent claim 58, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are neither shown not taught by the cited references.

Claim 63 recites a mixer configured to mix a plurality of components of a process fluid, a sensor configured to output a signal indicative of at least one of the components and a control system coupled with the sensor and configured to control mixing of the components responsive to the signal. Not one of the references, singularly or in any combination, teach or suggest the sensor configured to output to a signal indicative of a component of a process fluid and the control system configured to control mixing of the components responsive to the signal. Positively recited limitations of claim 63 are not shown or suggested in the art. Applicant requests allowance of Claim 63 in the next Office Action.

Claims 64-67 depend from independent claim 63, and therefore, are allowable for the reasons discussed above with respect to independent claim, as well as for their own recited features which are neither shown nor taught by the cited references.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The

undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: 9-20-01

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Application Serial No. 09/517,127
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Inventor ..... Scott E. Moore et al.
Assignee ..... Micron Technology, Inc.
Group Art Unit 3723
Examiner ..... T. Eley
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Title: "Semiconductor Processor Systems, A System Configured to Provide a Semiconductor Workpiece Process Fluid (As Amended)"

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING RESPONSE TO APRIL 25, 2001 OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indiciate insertions and ~~strikeouts~~ indicate deletions.

1. (Amended) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a connection coupled with the process chamber and configured to receive the process fluid;

a sensor coupled with the connection and configured to output a signal indicative of the process fluid;

a control system coupled with the sensor and configured to control at least one operation of the semiconductor processor system responsive to the signal~~.~~; and

wherein the sensor is configured to monitor turbidity of the process fluid.

27. (Amended) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece;

a process fluid system including:

a mixer configured to mix a plurality of components of a process fluid;

a connection configured to supply the process fluid to the process chamber; and

a sensor configured to output a signal indicative of at least one of the components ~~and the process fluid~~; and

a control system coupled with the sensor and configured to control mixing of the components responsive to the signal.

34. (Amended) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a process fluid system coupled with the process chamber and including:

a recirculation system configured to recirculate the process fluid~~; and~~ to a homogeneous level;

a sensor coupled with the recirculation system and configured to output a signal indicative of the process fluid; and

a control system coupled with the sensor and configured to control recirculation of the process fluid using the recirculation system responsive to the signal.

58. (Amended) A system configured to provide a semiconductor workpiece process fluid comprising:

a connection configured to transport a semiconductor workpiece process fluid relative to a semiconductor process chamber;

a sensor oriented relative to the connection and configured to output a signal indicative of the semiconductor workpiece process fluid;

a control system coupled to receive the signal from the sensor and configured to monitor the semiconductor workpiece process fluid using the signal~~;~~ and

a drain coupled to the connection, and the control system is configured to control the drain to remove at least a portion of the semiconductor workpiece process fluid from the system responsive to the signal from the sensor.

New Claims 130-140 have been added.

130. (New) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a connection coupled with the process chamber and configured to receive the process fluid;

a sensor coupled with the connection and configured to output a signal indicative of the process fluid;

a control system coupled with the sensor and configured to control at least one operation of the semiconductor processor system responsive to the signal;

wherein the connection comprises a connection of a sampling system configured to provide the process fluid in a substantially static state;

wherein the control system is configured to compare the substantially static process fluid with a signature to determine at least one characteristic of the process fluid; and

wherein the control system is configured to control a flow rate of the process fluid into the process chamber responsive to the comparison.

131. (New) The system according to claim 131 wherein the control system is configured to halt processing within the process chamber responsive to the comparison.

132. (New) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a connection coupled with the process chamber and configured to receive the process fluid;

a sensor coupled with the connection and configured to output a signal indicative of the process fluid;

a control system coupled with the sensor and configured to control at least one operation of the semiconductor processor system responsive to the signal; and

wherein the sensor is configured to monitor turbidity of the process fluid.

133. (New) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a connection coupled with the process chamber and configured to receive the process fluid;

a sensor coupled with the connection and configured to output a signal indicative of the process fluid;

a control system coupled with the sensor and configured to control at least one operation of the semiconductor processor system responsive to the signal; and

further comprising a flush system coupled with the connection and configured to selectively flush the connection.

134. (New) The system according to claim 133 wherein the flush system is configured to flush the connection with at least one of the process fluid and a rinse fluid.

135. (New) The system according to claim 133 wherein the flush system is configured to flush the connection responsive to control from the control system.

136. (New) A system configured to provide a semiconductor workpiece process fluid comprising:

a connection configured to transport a semiconductor workpiece process fluid relative to a semiconductor process chamber;

a sensor oriented relative to the connection and configured to output a signal indicative of the semiconductor workpiece process fluid;

a control system coupled to receive the signal from the sensor and configured to monitor the semiconductor workpiece process fluid using the signal;

a drain coupled to the connection and the control system is configured to control the drain to remove at least a portion of the semiconductor workpiece process fluid from the system responsive to the signal from the sensor; and

wherein the sensor is configured to output the signal indicative of turbidity of the semiconductor workpiece process fluid.

137. (New) A system configured to provide a semiconductor workpiece process fluid comprising:

a connection configured to transport a semiconductor workpiece process fluid relative to a semiconductor process chamber;

a sensor oriented relative to the connection and configured to output a signal indicative of the semiconductor workpiece process fluid;

a control system coupled to receive the signal from the sensor and configured to monitor the semiconductor workpiece process fluid using the signal;

a drain coupled to the connection and the control system is configured to control the drain to remove at least a portion of the semiconductor workpiece process fluid from the system responsive to the signal from the sensor; and

wherein the control system is configured to compare the signal with a signature to monitor the semiconductor workpiece process fluid.

138. (New) A system configured to provide a semiconductor workpiece process fluid comprising:

a connection configured to transport a semiconductor workpiece process fluid relative to a semiconductor process chamber;

a sensor oriented relative to the connection and configured to output a signal indicative of the semiconductor workpiece process fluid; and

a control system coupled to receive the signal from the sensor and configured to monitor the semiconductor workpiece process fluid using the signal;

a drain coupled to the connection and the control system is configured to control the drain to remove at least a portion of the semiconductor workpiece process fluid from the system responsive to the signal from the sensor; and

further comprising at least one metering device configured to permit flow of a component of the semiconductor workpiece process fluid, and the control system is configured to control the metering device to control a flow rate of the component responsive to the signal.

139. (New) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a process fluid system coupled with the process chamber and including:

a recirculation system configured to recirculate the process fluid to a homogeneous level;

a sensor coupled with the recirculation system and configured to output a signal indicative of the process fluid; and

a control system coupled with the sensor and configured to control recirculation of the process fluid using the recirculation system responsive to the signal; and

wherein the control system is configured to control the recirculation system to recirculate the process fluid responsive to the process fluid being out of specification.

140. (New) A semiconductor processor system comprising:

a process chamber adapted to process at least one semiconductor workpiece using a process fluid;

a process fluid system coupled with the process chamber and including:

a recirculation system configured to recirculate the process fluid to a homogeneous level;

a sensor coupled with the recirculation system and configured to output a signal indicative of the process fluid; and

a control system coupled with the sensor and configured to control recirculation of the process fluid using the recirculation system responsive to the signal; and

wherein the sensor is configured to monitor turbidity of the process fluid.

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